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Revision/Periodic Review Log

1.0 PURPOSE

The purpose of these instructions is to provide the Operations Group personnel with guidance to responding to radiation level alarms associated with the Radiation Monitor Micro and chipmunk monitors listed on channel 26.

2.0 SCOPE

The NSLS policies on radiation limits must be enforced during machine operations to comply with NSLS ALARA policies. This applies to all study, conditioning and operation periods. The radiation level limits are programmed into the automated radiation monitoring system and are also written in the NSLS Facility Manuals.

The chipmunk monitors are connected to the radiation monitor micro. The alarms generated are displayed on the main alarm system in the NSLS control room through a dedicated video monitor. An audible alarm will sound with each new alarm that is displayed.

3.0 RESPONSIBILITY

Machine Operator: It is the on-duty Machine Operator's responsibility to monitor radiation levels and ensure that they are kept within accepted Administrative Control Levels (ACL) during injection periods and ring operations. The video monitors in the control room shall be used to help the Operator monitor the radiation levels. He/she must respond accordingly and notify an authorized person, referred to in this document, when administrative levels have been reached or as stated in this document. All alarms received must be recorded in the Machine Operator's Log.

In the event the RAD MON micro is not functioning, the operator must call the appropriate responsible individual to restart the micro. If the micro is down for more than 1-hour when there is stored beam in the X-ray or VUV ring, the NSLS Safety Officer or Designee must be notified. If the micro is down in any other situation, injection/operations must stop and may not continue until the micro is up and running or approval is provided by the NSLS Safety Officer.

Operations Coordinator: The Operations Coordinator must monitor the radiation levels and be aware of the radiation levels when available to do so. The OPCO must respond to the Machine Operators request to investigate an area that may be reaching an established ACL level and to follow the instructions/requirements stated within this document.

4.0 ALARM PAGE OVERVIEW

The "Workday & Hourly Radiation" alarm page on channel 26 contains three columns of information. The *first column "Radiation Monitor"* on this alarm page indicates the radiation monitor (chipmunk) location. This information is determined by the NSLS ES&H Group and will only be changed with the group's approval.

The *second column "Wday Tot"* indicates the total radiation (in mRem) accumulated between 0830 hr and 1700 hr during normal workdays (Monday to Friday, regardless of holidays). The data collected in this column must be monitored throughout the normal workday and kept within the radiation ACLs stated in the matrix on page 4. This data will remain on the screen until 0830 hr the next day when the column of data is automatically reset.

The *third column "Hour Tot"* indicates the total radiation (in mRem) accumulated within one hour of the present time. These measurements must be continuously monitored to keep radiation levels within the accepted radiation ACLs stated in the matrix on page 4. An explanation of how the data in this column can be read is as follows:

> The hourly totals in the "Hour Tot" column are updated every 30 seconds and show the total radiation accumulated during the previous 60 minutes. For example:
> < At 1300 hr the reading will be the total radiation accumulated between 1200 hr & 1300 hr.
> < At 1301 hr the reading will be the total radiation accumulated between 1201 hr & 1301 hr.

The alarms for this system are set to the parameters listed in the Response Matrix on page 4. All alarm conditions that appear on channel 26 will also generate an audio/visual alarm on the NSLS Alarm System in the NSLS Control Room. An alarm condition will also be displayed in yellow or red, depending on the level of radiation and the time period (See table below).

Time Period	Alarm Condition	
Workday	1 mrem	4 mrem
Hourly	2 mrem	5 mrem

5.0 RESPONSE TO ALARMS

The matrix on page 4 is a guide for the Operations Group to follow while monitoring radiation levels on channel 26. This guide provides information needed for a proper response to increased levels of radiation at these monitored areas.

Response to alarms must begin at level 1 in the matrix and then continue to the next level of condition. Each alarm condition/level includes a separate operations group response. When required, the authorization list (LS-ESH-0034A) is to be utilized for obtaining permission to exceed an ACL.

To avoid reaching radiation ACLs, the Control Room Operator should reduce the radiation delivered by limiting beam-on time or reducing current. If a radiation ACL has been reached, the Operator must follow the instructions indicated on the response matrix. There after, injection may commence only when:

1. Conditions/requirements are met in the "Operations Group Response" & "Guidelines for Requesting Permission to Exceed ACL Level" columns in the matrix; or
2. The next allowable time frame exists (see matrix).

	During TIME PERIOD	RADIATION Administrative Control Level (ACL)	OPERATIONS GROUP RESPONSE If Radiation Administrative Control Level (ACL) Is Approached or Reached	Guidelines for Requesting Permission to Exceed ACL Level
1	0830-1700 hr. Normal Workday	**1.0 mrem** Total accumulated during 8½ hr period	1.) Contact NSLS Safety Officer or authorized individual listed on LS-ESH-0034A. Continue monitoring levels.	NSLS operator may continue with injection once the NSLS Safety Officer or authorized individual listed on LS-ESH-0034A is notified.
2	0830-1700 hr. Normal Workday	**4.0 mrem** Total accumulated during 8½ hr period	1.) Stop injection and turn off the gun pulse if radiation ACL is reached. 2.) Contact NSLS Safety Officer or authorized individual listed on LS-ESH-0034A. 3.) Personnel in the areas affected must be advised of the elevated levels and are required to wear a radiation badge. Persons not wearing a radiation badge must leave the area.	Permission must be granted by an authorized NSLS individual listed on attachment LS-ESH-0034A.
3	ALL TIMES	**2.0 mrem** in any hour	1.) Stop injection and turn off the gun pulse if radiation ACL is reached. 2.) Occupancy of these areas must be determined and noted in the Operations Log. 3.) Personnel in the areas affected must be advised of the elevated levels and are required to wear a radiation badge. Persons not wearing a radiation badge must leave the area.	Injection may continue after the Operations Group complies with the response requirements for this level. Notify NSLS Safety Officer or authorized individual listed on LS-ESH-0034A of the event. (If during off hour, notify next normal workday).
4	ALL TIMES	**5.0 mrem** in any hour	1.) Stop injection process affecting this area and contact NSLS Safety Officer or authorized individual listed on LS-ESH-0034A if radiation ACL is reached. 2.) Areas that exceed 5.0 mrem/hr become radiation areas and must be posted by an ES&H Radiological Control Technician (RCT) if operations are approved to continue.	1.) Such operation is not permitted without permission by the NSLS Chairman, Associate Chair for ESH, or Associate Chair for Operations. 2.) Permission for such operation should not be expected on short notice.

The decision to require personnel to leave office areas due to increased radiation levels must be made by an authorized NSLS individual listed on attachment LS-ESH-0034A. Proper postings and barriers must also be placed in these areas upon carrying out this decision.